DATA MANAGEMENT PLAN
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
NEWTOWN CREEK

Prepared by

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October 2011

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Appendix A Historical Data Review Form

LIST OF ACRONYMS AND ABBREVIATIONS

Abbreviation	Definition
AOC	Administrative Order on Consent
ASAC	Activity Specific Acceptance Criteria
BERA	Baseline Ecological Risk Assessment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CLP	Contract Laboratory Program
COC	Chain-of-Custody
COPC	Constituent of Potential Concern
CSF	Complete Sample Delivery Group File
CSM	Conceptual Site Model
DCP	Data Collection Plan
DMP	Data Management Plan
DQO	Data Quality Objective
EDD	Electronic Data Deliverable
EDP	EQuIS Data Processor
ERA	Ecological Risk Assessment
FS	Feasibility Study
FSAP	Field Sampling and Analysis Plan
GC/MS	Gas Chromatography-Mass Spectrometry
GIS	Geographic Information System
GPS	Global Positioning System
HHRA	Human Health Risk Assessment
ICP	Inductively Coupled Plasma
ICPMS	Inductively Coupled Plasma Mass Spectrometry
JPEG	Joint Photographic Experts Group
MB	Megabytes
MDAC	Minimum Data Acceptance Criteria
MS/MSD	Matrix Spike/Matrix Spike Duplicate
NAD	North American Datum
NAVD	North American Vertical Datum

NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NYC	New York City
NYCDEP	New York City Department of Environmental Protection
NYSDEC	New York State Department of Environmental Conservation
OCR	Optical Character Recognition
PAR-HHRA	Pathway Analysis Report
PDF	Portable Document Format
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
RAID	Redundant-array-of-independent-disks
RI	Remedial Investigation
RI/FS	Remedial Investigation/Feasibility Study
RPD	Relative Percent Difference
SDG	Sample Delivery Groups
SLERA	Screening Level Risk Assessment
SMIA	Significant Marine and Industrial Area
SOP	Standard Operating Procedure
SPDES	State Pollutant Discharge Elimination System
SSF	Standard Storage Format
TEQ	Toxic Equivalent
TIFF	Tagged Image File Format
UPS	Uninterruptable Power Supply
USEPA	United States Environmental Protection Agency

1 INTRODUCTION

This Data Management Plan (DMP) provides the data management process and procedures for the performance of work activities associated with data collection for the Newtown Creek Remedial Investigation/Feasibility Study (RI/FS) as described in the RI/FS Work Plan (AECOM 2011). This work is being performed under an Administrative Order on Consent (AOC) between the Respondents to this AOC and the United States Environmental Protection Agency (USEPA) under the USEPA *Comprehensive Environmental Response, Compensation, and Liability Act* (*CERCLA*) program. The procedures and policies described in this DMP are consistent with the National Oil and Hazardous Substances Pollution Contingency Plan, 40 C.F.R. Part 300 (NCP). All work performed under the AOC will be in compliance with CERCLA, the NCP, and all applicable USEPA guidance, policies, and procedures, including, without limitation, USEPA Region 2's "Clean and Green Policy" (USEPA 2011a, b)

The RI/FS Work Plan is an attachment to the AOC and the DMP is a supporting plan to the RI/FS Work Plan. The RI/FS Study Area is defined in the AOC as Newtown Creek and its tributaries (Dutch Kills, Maspeth Creek, Whale Creek, East Branch, and English Kills) having an approximate 3.8-mile reach (Figures 1-1 and 1-2) to the high water mark.[1]

This DMP describes the management of both historical information and data resulting from field investigations during Phase 1 and Phase 2 of the Remedial Investigation (RI). For the purposes of this plan, historical information is defined as any available and relevant data set

[1] The Newtown Creek Superfund Site Study Area is described in the AOC as encompassing the body of water known as Newtown Creek, situated at the border of the boroughs of Brooklyn (Kings County) and Queens (Queens County) in the City of New York and the State of New York, roughly centered at the geographic coordinates of 40° 42' 54.69" north latitude (40.715192°) and 73° 55' 50.74" west longitude (-73.930762°), having an approximate 3.8-mile reach, including Newtown Creek proper and its five branches (or tributaries) known respectively as Dutch Kills, Maspeth Creek, Whale Creek, East Branch, and English Kills, as well as the sediments below the water and the water column above the sediments, up to and including the landward edge of the shoreline, and including also any bulkheads or riprap containing the waterbody, except where no bulkhead or riprap exists, then the Study Area shall extend to the ordinary high water mark, as defined in *33 CFR §328(e)* and the areal extent of the contamination from such area, but not including upland areas beyond the landward edge of the shoreline (notwithstanding that such upland areas may subsequently be identified as sources of contamination to the waterbody and its sediments, or that such upland areas may be included within the scope of the Newtown Creek Superfund Site as listed pursuant to Section 105(a)(8) of the *CERCLA).*

or document predating the implementation of the Phase 1 RI/FS Work Plan and Phase 1/Phase 2 Quality Assurance Project Plan (QAPP; Anchor QEA 2011a). The DMP may be revised, amended, and updated as the RI/FS process evolves and additional RI/FS activities are identified. In accordance with the AOC, proposed revisions and modifications will be documented in a memorandum to be submitted to the USEPA Project Coordinator within 10 days of the identified need for the modification.

The DMP is divided into eight sections. Section 2 provides the background on the Study Area, RI/FS goals and objectives, and the elements and phasing of the RI/FS. Section 3 describes the data management personnel. Section 4 presents the methods by which data will be handled and the responsibilities of the various personnel in management of the data. Section 5 summarizes how data will be recorded and documented in various ways during the RI/FS. Section 6 describes data security and protection measures. Section 7 provides information on data transmittal to regulating agencies. References are listed in Section 8.

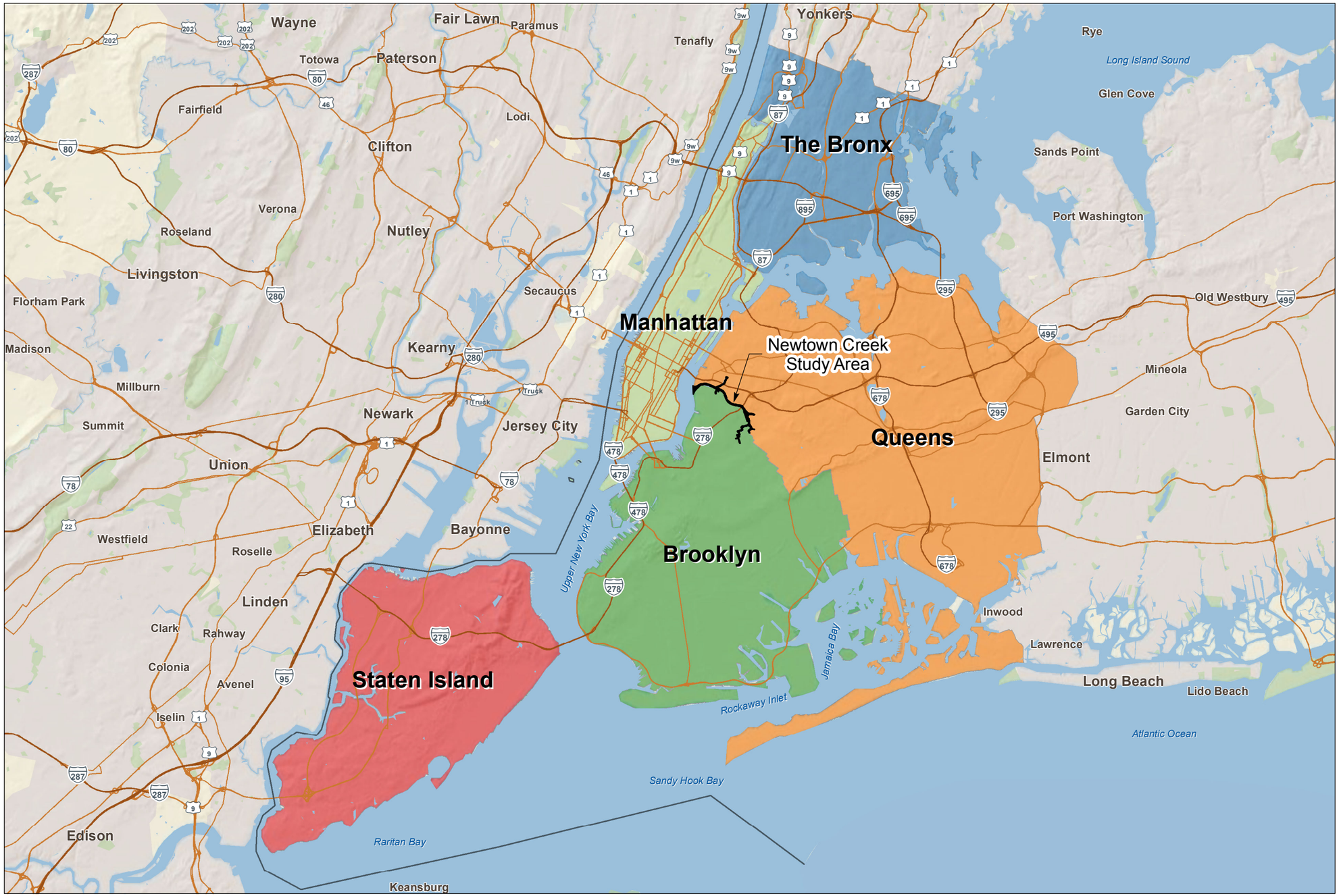

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Figure 1-1
Location Map
Data Management Plan
Newtown Creek RI/FS

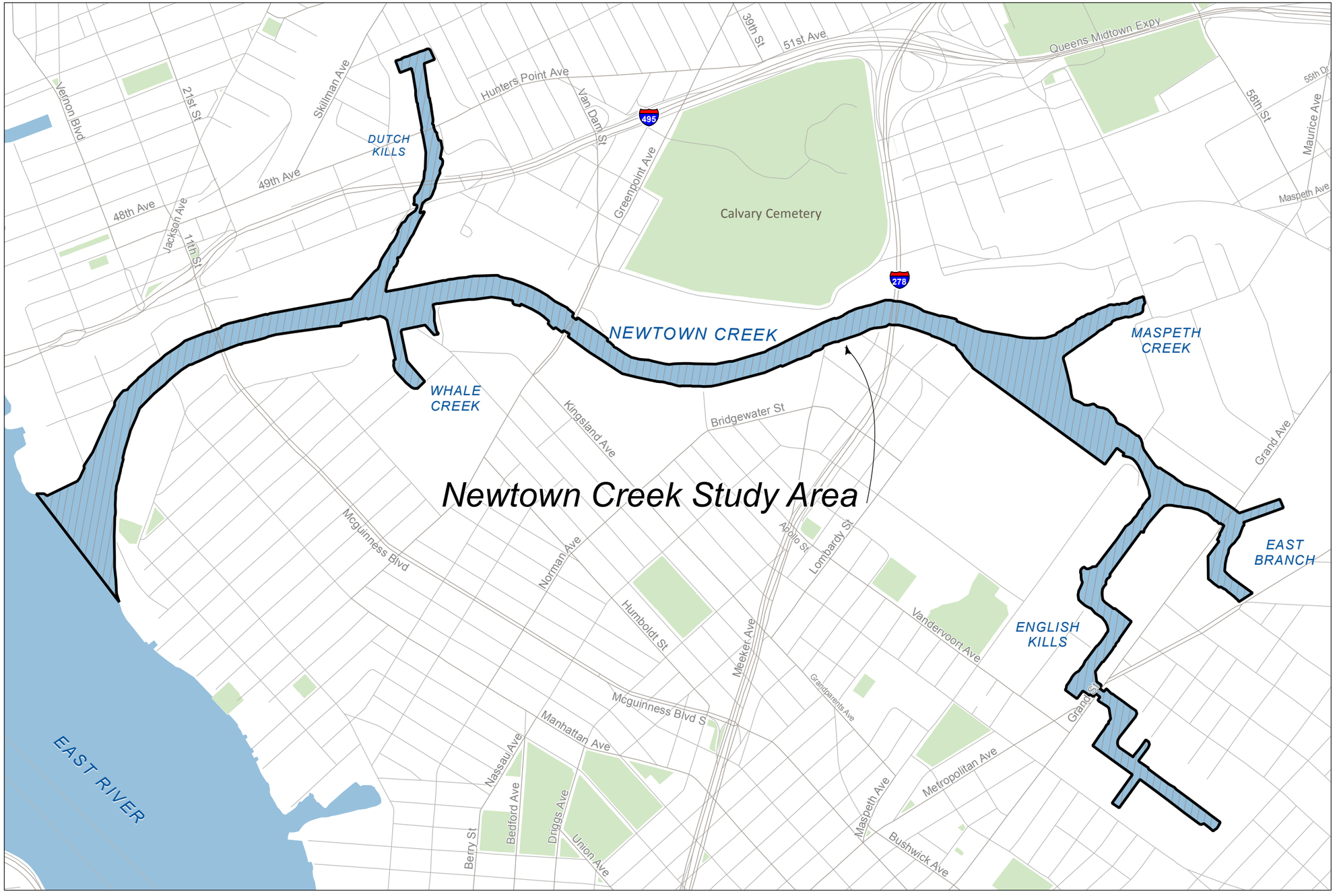

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Figure 1-2
Study Area Location
Data Management Plan
Newtown Creek RI/FS

2 STUDY AREA AND REMEDIAL INVESTIGATION/FEASIBILITY STUDY OVERVIEW

This section describes the Study Area history, provides a summary of the RI/FS objectives, and outlines the phased approach for the completion of the RI/FS. Additional information on these topics is provided in the RI/FS Work Plan (AECOM 2011).

2.1 History

The Newtown Creek area of Brooklyn and Queens has a history of extensive industrial development stretching back to the 1800s. This development resulted in major reworking of the banks and channel for drainage, municipal discharges, and use for navigation purposes. The channelizing and deepening of Newtown Creek and its tributaries was largely completed to its current configuration by the 1920s and 1930s. This historical development has resulted in changes in the nature of Newtown Creek and its tributaries from a natural drainage condition to one that is largely governed by engineered and institutional systems. Currently, the predominant land use around Newtown Creek and its tributaries includes industrial, manufacturing, transportation, and utility facilities. The majority of land around Newtown Creek and its tributaries is designated by New York City (NYC) as one of the City's six Significant Maritime and Industrial Areas (SMIAs). NYC's designation of the area around the Study Area as a SMIA reflects NYC's determination that the anticipated future uses of surrounding property include maritime industrial uses as well as other compatible industrial uses.

2.2 RI/FS Goals and Objectives

The goal of the RI/FS is to conduct a scientifically sound, comprehensive investigation of the Study Area following the appropriate USEPA and New York State Department of Environmental Conservation (NYSDEC) guidance documents and the principles outlined in the USEPA *Contaminated Sediment Remediation Guidance for Hazardous Waste Sites* (USEPA 2005) for the purpose of providing the basis for sound scientifically-based decisions on the future condition of the Study Area. The following specific objectives have been established to achieve this goal:

1. Identify, quantify, and understand the vertical and horizontal distribution of constituents of potential concern (COPCs) in sediment and surface water, and other constituents and stressors that may impact the ecology and quality of the Study Area

sediment, water, and biota. This will include a characterization of COPCs in the Study Area, notwithstanding whether the initial release included petroleum or any other substance. The synergistic relationships among substances will be considered to the extent necessary for such characterization.

2. Identify and quantify significant loadings of COPCs and, to the extent of the available information, sources of such loadings to the Study Area surface water, sediments, groundwater, and biota. In the case of ongoing upland sources, refer future investigation of sources to the appropriate regulating agency (i.e., USEPA, NYSDEC, or the NYC Department of Environmental Protection [NYCDEP]). For more details on evaluation of upland sources see Section 3.2.4 of the RI/FS Work Plan. As stated in USEPA *Contaminated Sediment Remediation Guidance for Hazardous Waste Sites* (USEPA 2005), sources of contaminants to sediments must be controlled early and if recontamination is likely to occur, then sources should be controlled prior to establishing end points and to the implementation of sediment remedies. Therefore, it is important to identify and control significant sources of contaminants to the Study Area prior to implementing an effective remedy.
3. Understand the key geomorphological, chemical, and biological processes affecting the stability of sediments and the fate, transport, and bioavailability of COPCs.
4. Identify complete and reasonably potentially complete (considering the urban nature of the Study Area and the impact of future contaminant loadings on the ecology and quality of the Study Area) exposure pathways and identify potential current and future human health and ecological risks posed by the COPCs present in the Study Area.
5. Identify and evaluate potential remedial actions that provide meaningful risk reduction and provide the highest, best possible use of the Study Area, considering the urban nature of the Study Area and the impact of future contaminant loadings on the ecology and quality of the Study Area.

2.3 Phased Investigation Approach for the RI/FS

The proposed approach for completion of the RI/FS includes phasing of field investigations and associated evaluations and reporting. Per USEPA *CERCLA* Guidance (1988, Section 1.4.2), "field sampling should be phased so that the results of the initial sampling efforts can

be used to refine plans developed during scoping to better focus subsequent sampling efforts. Data quality objectives (DQOs) are revised as appropriate based on an improved understanding of the site to facilitate a more efficient and accurate characterization of the site and, therefore, achieve reductions in time and cost." The DQO process is described in *Guidance on Systematic Planning Using the Data Quality Objectives Process* (USEPA 2006). The proposed approach includes two, or possibly more, primary phases of field investigation and the associated evaluating and reporting steps, as described below:

- **Phase 1 RI Field Program** – The Phase 1 RI Field Program considers available pre-RI data and proposes collection of sediment, surface water, ambient air, and groundwater samples, and completion of physical, biological, and shoreline area surveys. This phase of work is intended to generally characterize the physical properties of the Study Area, identify areas of interest or significant features for future sampling during the Phase 2 RI Field Program or the Baseline Ecological Risk Assessment (BERA) Field Sampling Program and characterize the nature and extent of COPCs in sediment and surface water. The ambient air sampling will evaluate baseline concentrations of specific airborne chemicals for current conditions, measure the level of ambient air concentrations that would be experienced within the breathing zone in or adjacent to the Study Area, and estimate the portion of the measured concentrations that are potentially attributable to the Study Area and its shoreline. Groundwater samples will be collected to identify significant loadings of COPCs and, to the extent of the available information, sources of such loadings to the Study Area.
- **Historical Data Review** – This data review will be conducted prior to and concurrent with the Phase 1 RI Field Program. It will include an evaluation of the available historical data regarding geology, hydrogeology, and land use with the purpose of identifying significant loadings of COPCs, and to the extent of the available information, sources of such loadings, that may impact Study Area biota, sediments, and surface water through groundwater discharge and point and nonpoint source discharges.
- **Screening Level Ecological Risk Assessment (SLERA)** – These activities will be conducted concurrently with the Phase 1 RI Field Program using existing (pre-RI) data and will incorporate the Phase 1 RI Field Program habitat survey and biological surveys. The SLERA and the BERA Problem Formulation are intended to be combined into one document. This document will be produced following a BERA

Workshop where preliminary SLERA results and a BERA Problem Formulation outline will be discussed in detail with USEPA. These activities will be conducted prior to the completion of the BERA Work Plan to allow identification of data gaps that will be addressed in the BERA Field Sampling Program.

- **Phase 2 RI Field Program** – The Phase 2 RI Field Program will be completed following the review of historical data, e.g., existing reports on upland properties (including geology and hydrogeology), information on pipe discharges, and observations of pipe discharges, seeps, and nonpoint source stormwater flow in the Study Area. Phase 1 RI Field Program data (e.g., results of shoreline survey and groundwater sampling) will be incorporated into the design of the Phase 2 RI Field Program. This phase of work will include sampling of the pipes, seeps, and, to the extent necessary to identify significant loadings of COPCs, nonpoint source stormwater and groundwater (using in-creek techniques and/or land-based monitoring wells). Should an upland site ultimately require the installation of upland wells to fully characterize the upland contaminant loadings, this characterization will be the subject of the process outlined in RI/FS Work Plan Section 3.2.4 and AOC Section XI, Paragraph 54.e and AOC Section XII, Paragraph 58.b. The objective of this phase of work is to complete the identification of ongoing sources of significant loadings of COPCs, and to the extent of the available information, sources of such loadings, to the Study Area.

  Specifically, the Phase 2 RI Field Program is intended to characterize significant contaminant loadings from point and nonpoint source discharges to the Study Area (including groundwater) having potential significant impact on the implementation of an effective remedy. Identification of significant upland sources will use a multiple-lines-of-evidence approach consisting of: 1) information obtained from the aforementioned Historical Data Review; 2) Phase 1 RI Field Program data obtained from the shoreline survey and sampling of various media; and 3) Phase 2 RI Field Program in-creek assessment methodologies (including use of a Trident Probe, or similar sampling technology and/or groundwater monitoring wells). Additionally, the Phase 2 RI Field Program will include collection of physical and/or chemical data to fill data gaps identified at the end of the Phase 1 RI Field Program and will include the collection of the data needed to support the Human Health Risk Assessment

(HHRA).

- **BERA Field Sampling Program** – The BERA Field Sampling Program will rely on pre-RI data and the initial findings of the Phase 1 RI Field Program, including the findings of the habitat survey, to focus ecological data collection to the appropriate locations, and the results of the SLERA and of the BERA Problem Formulation. This phase of field work will focus on collecting the information necessary to complete the Ecological Risk Assessment (ERA).
- **RI Reporting** – The results of the RI data collection activities will be summarized in several reports. A Phase 1 RI Interim Data Report will be prepared prior to the midpoint of the Phase 1 RI Field Program to summarize the results of the surveys performed (bathymetric, side-scan sonar, and magnetic surveys; aerial photography survey; and shoreline assessment) and the Historical Data Review information obtained up to that point in time, including the groundwater assessment. This interim data report will serve as the basis to identify potential significant loadings of COPCs and, to the extent of the available information, sources of such loadings to the Study Area for consideration of Phase 1 in-creek and/or land-based sampling. The results of the Phase 1 RI Field Program will be summarized in the Phase 1 RI Data Summary Report. As needed, additional interim data reports will be prepared during the various phases of RI field work. The combined results from the Phase 1 and Phase 2 RI Field Programs will be summarized in the RI Report.
- **BERA** – The BERA will rely on the results of the Phase 1 and Phase 2 RI Field Programs, the BERA Field Sampling Program, and the food web modeling.
- **HHRA** – The HHRA will be outlined for discussion and comment by USEPA in the Pathway Analysis Report (PAR-HHRA). The PAR-HHRA will include the HHRA Conceptual Site Model (CSM) and details of exposure and toxicity data to ensure the approach for the HHRA is acceptable to USEPA. The HHRA will involve a review of sampling data for environmental media associated with the Study Area collected during the Phase 1 RI, Phase 2 RI, and BERA field programs and will also rely on the results of the food web modeling.
- **Feasibility Study (FS) Field Program** – The FS Field Program, if necessary, will be scoped following the completion of the RI, ERA, and HHRA. This phase of field work will provide the information needed to complete the FS and may include additional sediment sampling in select areas of the Study Area for select constituents,

sediment sample collection to refine volumes for remediation areas, and treatability tests for candidate remedial technologies.

The field programs of the RI/FS are not intended to be completed sequentially, but will be scheduled and implemented as information is obtained to enable execution of the field programs and as USEPA approval of field program scope is obtained.

3 PERSONNEL

Newtown Creek and its tributaries will be extensively sampled for a wide range of matrices and analytes, the results of which will be assessed by various teams in the RI/FS process. Although all personnel working on the RI/FS have a role in data quality control, the following personnel have primarily responsibility for ensuring that accurate, efficient data management procedures are implemented and used.

Title	Name
RI/FS Technical Lead	Tom Schadt
RI/FS Project Manager	James Quadrini, P.E., BCEE
RI Manager	James Keithly
FS Manager	Paul LaRosa, P.E.
Risk Assessment Manager	David Glaser, Ph.D.
Field Team Leader	David Gillingham Amy Corp Calvin Douglas Joy Dunay Adam Gale Ben Howard Jason Kase Mark LaRue Margaret Murphy Chris Pelrah Delaney Peterson Joe Pursley Jim Ryan Jim Shannon Charlie Szablewski Joe Volosin Chris Yates
Data Management Task Manager	Mark Meyers, Ph.D.
Historical Data Review Task Manager	Keith Pine
Project Quality Assurance (QA) Coordinator	Leslie McKee
Project Chemist	Joy Dunay
Data Validation Coordinator	Delaney Peterson

Additional information on RI/FS key personnel, including job descriptions, is provided in the QAPP (Anchor QEA 2011a) Worksheet #7 entitled, "Personnel Responsibilities and Qualifications Table." Any changes in key personnel will be communicated in the monthly progress reports to USEPA.

4 PROJECT DOCUMENTATION AND RECORDS

Field data will be collected and historical data will be compiled to support the RI/FS. This section describes the types of documentation that will be included for contemporary and historical datasets, the databases that will be used, how the data will be archived, and database input requirements.

4.1 Contemporary Data

This section describes the documentation and record keeping requirements for field-related data collected during the RI/FS process, in accordance with the AOC, CERCLA, and NCP requirements and policies.

4.1.1 Types of Data to be Collected

Field data will be documented and recorded in various ways during the RI/FS. The following is a list of the various field documents and records that may be produced during project data-gathering activities. Additional information regarding maintenance of project documents and records is provided in QAPP Worksheet #29.

- Airbills
- Chain-of-custody (COC) records
- Communication logs/e-mails
- Corrective action reports
- Documentation of corrective action results
- Documentation of deviation from methods
- Documentation of internal quality assurance (QA) reviews
- Electronic data deliverables (EDDs)
- Field data collection forms
- Sampling notes in bound, waterproof field log books
- Field instrument calibration logs
- Global Positioning System (GPS) files
- Identification of quality control (QC) samples
- Identification of USEPA split samples
- Photographs

- Sampling equipment decontamination records
- Sampling location figures (based on targeted and actual coordinates)

These records will be created in either written (e.g., sampling notes) or electronic formats (e.g., GPS files, measurement instrument/data-logger files, and field databases).

4.1.2 Database for Field Data and Analytical Data

Anchor QEA will maintain RI/FS field and analytical data in an EQuIS Professional database (version 5.5). This system will hold information about locations, field measurements, samples, laboratory tests and results. Access to the database will be restricted to data management personnel. In general, project personnel will have the ability to view, but not modify, the data. The ability to add or correct data will be granted to only those individuals identified by the Data Management Task Manager and trained to perform those tasks.

4.1.3 Project Data File Archives

Original field data documents will be archived in Anchor QEA's project files (e.g., field sheets, hard copy maps, and field log books) and electronic files (e.g., field data collection applications, electronic data logger files, GPS files, and photographs) will be archived on a secured server in a project-dedicated folder and/or on Anchor QEA's SharePoint site using an appropriate file type (e.g., Standard Storage Format [SSF] for GPS files; Tagged Image File Format [TIFF] or Joint Photographic Experts Group [JPEG] for photographs; and Excel or InfoPath formats for electronic field forms). In addition, all paper field records will be scanned and stored electronically (as portable document format [PDF] files) with other project electronic files, as indicated above. Documents will be maintained at Anchor QEA offices or at an off-site secure document repository for a minimum of 10 years after commencement of construction of any remedial action, in accordance with the retention of records section of the AOC.

4.1.4 Field Electronic Data Deliverables

Field data will be exported into one or more Field EDD formats from field data collection applications to be loaded directly into the project's environmental database. Data transferred

from written records to field data EDDs will be reviewed against field records prior to being loaded into the database.

4.1.5 Laboratory Electronic Data Deliverables

For laboratory analytical data, each laboratory (whether or not it is a Contract Laboratory Program [CLP] laboratory) will provide an EDD and one copy of a Level IV, CLP type data package (unless otherwise specified in the QAPP [Anchor QEA 2011a] or Field Sampling and Analysis Plan [FSAP; Anchor QEA 2011b]). Each laboratory is responsible for ensuring that all data reported in the electronic copy and data package match. The data deliverable will include a summary package that contains, at a minimum, the case narrative, custody documentation, method citations, field and laboratory sample identifiers cross-reference, sample results (including all raw data needed to support those results), preparation and analysis dates, and summary QC forms. The summary package and CLP-like package will be provided to Anchor QEA as a bookmarked, Adobe Acrobat file.

Complete paginated data packages will contain the following minimum information:

- A narrative addressing any difficulties encountered during sample analysis and a discussion of any exceedances in the laboratory QC sample results
- A cross-referenced table of field and laboratory identification numbers
- Analytical method references
- Definition of any data flags or qualifiers used; a list of valid data flags and qualifiers for use in the EQuIS reporting format will be provided by Anchor QEA following contract award
- A table of contents for the data package similar to the USEPA Complete Sample Delivery Group File (CSF) Audit Checklist
- A COC signed and dated by the laboratory to indicate sample receipt. The temperature of the cooler upon receipt will be noted on the COC. Copies of shipping air bills will also be provided
- Results for each field sample, blank and QC sample in units appropriate to the method presented in Form 1s or equivalent; method detection limits and reporting limits will also be provided and any analyte that is not detected will be reported as less than the reporting limit

- Dilution factors for each sample or analyte
- Calibration data including raw data; initial calibration curve data such as linear regression statistics or average relative response factors and percent relative standard deviation; continuing calibration data such as relative response factors and percent difference data
- Gas Chromatography-Mass Spectrometry (GC/MS) and Inductively Coupled Plasma Mass Spectrometry (ICPMS) tuning data
- Internal standard data
- Surrogate (system monitoring) data
- Inductively Coupled Plasma (ICP) inter-element correction factors, linear range data, serial dilution data, and interference check sample results
- Copies of laboratory notebook pages or preparation logs showing sample preparation documentation
- Field sample results and raw data (chromatograms and ICP printouts) including dilution data
- Laboratory QC data including method blank data, laboratory duplicate data reported as relative percent difference (RPD), laboratory control spike data, reported as percent recovery; matrix spike/matrix spike duplicate (MS/MSD) data reported as percent recovery with RPD calculated; all associated raw data must also be provided
- Copies of phone logs, faxes, and e-mails associated with the sample set
- Any other data necessary to conclusively confirm the analytical results reported and the overall quality of the data

The associated Anchor QEA EDD will be provided by Anchor QEA. A current file of valid reference values will be provided to each laboratory by Anchor QEA, along with the Anchor QEA EDD. Verification of EDD formatting and completeness will be performed by Anchor QEA data management personnel during upload. EDDs received from the laboratory that contain errors will be returned to the laboratory for corrections.

4.2 Historical Data

This section describes document management for historical records, documents, and data. Historical data refer to data predating the RI/FS for the area that drains to the Study Area.

Historical data are discussed further in the Data Collection Plan (DCP; Anchor QEA 2011c). Because the RI/FS Study Area is defined in the AOC as the boundaries of Newtown Creek and its tributaries, and does not include upland areas landward of the shoreline, the collection and evaluation of historical information from upland areas is limited to information relevant to identifying and quantifying significant loadings of COPCs and, to the extent of available information, sources of such loadings.

4.2.1 Types of Historical Data to be Collected

The Respondents will compile and evaluate environmental, ecological, and hydrogeologic data from studies or other activities that predate the RI as part of the Historical Data Review (Section 3.2.1 of the RI/FS Work Plan [AECOM 2011]). The approach to gathering these data is summarized in a separate document, the DCP (Anchor QEA 2011c). The approach to management of these data is provided in this DMP. The following is a list of the types of information that may be collected as part of the Historical Data Review:

- Reports (including environmental investigation and remediation reports, dredging reports, outfall surveys)
- Maps (including Sanborn maps, other historical maps, land use maps, industrial atlases, water well maps)
- Aerial photographs
- Permits (including State Pollutant Discharge Elimination System [SPDES])
- Other regulatory documents
- Numeric data (including groundwater monitoring data, analytical data, hydraulic/hydrologic model data, subway dewatering data)

It is assumed that historical documents, records, and data will be obtained in various formats including the following:

- Report/document (electronic or hard copy)
- Maps and aerial photos (electronic/non-editable or hard copy)
- Tabular (hard copy)
- Tabular – non-editable (electronic)
- Tabular – editable (electronic)
- Database

- Geographic Information System (GIS) coverage

Data will be maintained in appropriate file types. For example, aerial photos may be stored as JPEG files, spreadsheet data may be stored as spreadsheet files (e.g., Microsoft Excel files), reports may be stored as text (e.g., Microsoft Word) files or PDF files, etc. Hard copy originals will be scanned into PDF files as described in the DCP (Anchor QEA 2011c).

Quantitative, numerical data and spatial (cartographic) data may be convertible into useable database and GIS formats. Such data will be segregated from contemporary environmental data, but managed and maintained in a similar manner. These will be reviewed for minimum quality requirements and qualified for their appropriate usage in the RI/FS, as described further below and in the DCP (Anchor QEA 2011c).

Non-quantitative records can still aid in CSM development, understanding of the chronology and spatial distribution of sources and the nature of contaminants of potential concern. These records will be stored in a repository, as described below.

4.2.2 Historical Data Repository

An electronic document repository will be developed to house the historical documents relevant to the RI/FS. This will be developed using Microsoft SharePoint or a similar web-enabled system, providing password-protected access to project personnel, including the Respondents. The ability to add or change information will be restricted to only those individuals identified and trained to perform those tasks.

Hard copy and static documents will be scanned, reviewed for usability, and stored electronically within the repository. Electronic documents will be reviewed for usability, and stored within the repository. Documents will be filed based on the primary document content.

4.3 Document Retention

Retention of records will be performed in accordance with Section XIV of the AOC (USEPA 2011c). Hard copy documents will be maintained in a project-specific location. Non-

identical copies of documents will be maintained for a minimum of 10 years after commencement of construction of any remedial action. In the context of the AOC, documents include hard copy documents, records, and other information in electronic form. The scope of this retention policy covers material "that relate in any manner to the performance of the work or the liability of any person under CERCLA with respect to the Study Area, regardless of any corporate or governmental retention policy to the contrary" (USEPA 2011c). This will hold true for subcontractors.

5 DATA HANDLING AND MANAGEMENT

Data management procedures are established to effectively process analytical and measurement data generated during the RI/FS such that the relevant data are readily accessible and accurately maintained. There are multiple activities involved in the recording, storage, processing, and maintenance of the project datasets and the systems that manage them. In order to ensure that data are accurately recorded and stored, tracking systems will be implemented. Automated and manual QC checks will be conducted to verify that data have been accurately recorded and appropriately stored. Corrective actions will be taken in the event data have not been properly handled. General data handling and management as well as information on naming conventions, loading and reporting of laboratory analytical data, are provided in this section.

5.1 Contemporary RI/FS Data

The following describes the data handling and management of data collected during the RI/FS, including field data and laboratory analytical data. Field and laboratory analytical data will be loaded into an EQuIS database using EDDs. These EDDs will be saved and stored in project-specific folders located on a secure server.

5.1.1 Data Management Process for Field-Related Data

Three general types of data will be collected and recorded in the field: data to support sample collection and analysis, field measurements, and field observations. The overall data collection and management process for these data is provided in Figure 5-1. The major steps in the field data management process, tracing the types of data from their generation through final use and/or storage, and the responsible persons, are described in Table 5-1. The roles and responsibilities of the staff conducting field data management are as follows (see also QAPP Worksheet #7):

- Data Management Task Manager – Responsible for data management for RI/FS, including overall responsibility for EQuIS database quality and structure, including summarization of data for completion of RI, CSM, and FS.
- Data Management Staff – Responsible for transcription of field data to EDD format, loading of field and laboratory analytical EDDs, updating the database as required and running reports from the database.

- Field Team Leader – Responsible for the documentation of proper sample collection protocols, sample collection, equipment decontamination, and COC documentation. Also responsible for the proper use of electronic field data collection applications and equipment, and the review of field notebooks, COC records, sample labels, and other field-related documentation.
- Field Team Staff – Responsible for collection field data including samples for analysis, field measurements, and observations of the Study Area.
- Project Chemist – Serves as the analytical laboratory coordinator and the primary point of contact with the laboratories and responsible for laboratory procurement and monitoring of progress.
- Data Validation Coordinator – Responsible for managing the data validation task, including ensuring that validation of analytical data is conducted and documented according to the requirements of the QAPP, and interacting with the laboratories to resolve any issues. The Data Validation Coordinator is also responsible for updating the database with the qualifiers and any other edits resulting from data validation.
- Project QA Coordinator – Responsible for the review of project plans and revisions to the plans to maintain proper QA throughout the investigation; performance and system audits, data processing QC, data quality review, monitoring the effectiveness of corrective actions, and coordinating the QA/QC efforts between Anchor QEA and subcontractors, including analytical laboratories.
- Laboratory Project Manager – Acts as the primary point of contact at a laboratory facility for the Project Chemist to communicate and resolve sampling, receipt, analysis, and storage issues.

Prior to the collection of field data, as described in the previous section, project-specific hard copy and electronic filing systems will be established. The field data collection process is described in the FSAP. Once the field data are collected, they will be reviewed and processed. The following general steps will be followed to manage the field data: 1) review of field data for accuracy and completeness; 2) review of field data against planned activities and project standards; 3) processing of field-related data; and 4) filing/archiving of field data.

In the first step, electronic and written records created in the field will be submitted to the Field Team Leader for review by the field team staff. The Field Team Leader will complete the following activities:

- Review written field records to ensure that field records and notes are complete (see Standard Operating Procedure (SOP) NC-01 in the FSAP) and review electronic records to ensure they are complete.
- Ensure corrections are made and noted for any incomplete records.
- Scan written records and forward scanned and electronic files to Data Management Task Manager. Written records will be batched and sent weekly to the Data Management Task Manager.

In the second step, the data collected will be reviewed to ensure that it conforms to planned activities and standard nomenclature established for the RI/FS, as described in the FSAP. The following activities will be completed as part of this step:

- Review of field records against FSAP scope of work, and any planned deviations (e.g., due to field conditions), by the Data Management Task Manager
- Review of field records against standard nomenclature for RI/FS (as provided in the FSAP) by the Data Management Task Manager
- Review of COCs against sampling forms by the Project Chemist
- Communication of errors to the Field Team Leader and RI Manager
- Ensuring corrections are made and noted for any errors (Data Management Task Manager and/or Project Chemist)
- Ensuring data files are saved to project files (Data Management Task Manager)

In the third step, various types of field-related data are processed. The following activities are conducted by the data management staff as part of this step:

- Export from field data collection application or transcription of applicable field data to field data EDD format
- QA/QC check of transcribed data against field data EDD
- Loading of field data EDD to project database (see Section 5.1.3.1)
- Review of laboratory analytical EDD
- Loading of laboratory analytical EDD (see Section 5.1.4.1)

The last step of the field data management process is ensuring that all data are filed in the appropriate project folders. The Data Management Task Manager will be responsible for ensuring that all field data files are stored electronically in the project folders and all paper copies are stored in the paper project folders.

5.1.2 Naming Conventions

Naming conventions for samples collected in the field (also provided in the FSAP and QAPP) are described in this section.

These conventions are designed to ensure that unique identifiers are created for samples collected during RI/FS activities. Blind field replicates and other QC samples will have distinct conventions as well as specific sample types encoded in the proper database fields. While sample identifiers may be informative, they should never be parsed or used to infer information about the collected sample. Once created, an identifier will not be changed. If sample collection information needs to be corrected, this will not be reflected in the sample identifier. Information about the sample, including composition, matrix, location, and date and time collected, will be accurately stored in relevant database fields and must be used as appropriate during data analysis.

Samples will be uniquely identified at the time of collection. Nomenclature is {station identification}{matrix code}-{depth}-{date}

- Station identifier = 5-character identifier for the station. The identifier will begin with a 2-character identifier to indicate whether the station is located in Newtown Creek or a tributary and will be followed by a 3-digit number that indicates the position. Field duplicates will be identified by adding 1000 to the 3-digit position number. The character codes are as follows:
  - NC = Newtown Creek
  - DK = Dutch Kills
  - WC = Whale Creek
  - MC = Maspeth Creek
  - EB = East Branch

  - EK = English Kills

- Rinsate and trip blanks will not require a station identifier.
- Matrix code = 2-character code to indicate the sample matrix. Matrix codes are as follows:
  - SC = Chemistry sediment core
  - GC = Geochronology sediment core
  - SG = Sediment grab
  - SF = SedFlume core
  - SW = Surface water
  - TP = Tidal profile
  - AR = Air
  - RB = Rinsate blank
  - TB = Trip blank
- Depth:
  - Sediment samples = 6-character identifier indicating the depth in centimeters from where the samples were collected. The first 3 characters will indicate the top of the interval, the last 3 characters will indicate the bottom of the interval, and the two will be separated by a hyphen (###-###).
  - Depth, water = Surface waters will be designated by three depth indicators:
    - A = Near surface
    - B = Middle
    - C = Near bottom
- Air samples, rinsate blanks, and trip blanks will not require a depth identifier.
- Date = 8-character code to indicate the date the sample was collected in the format YYYYMMDD.

For example:

- A chemistry core sample collected at the 26th station in Newtown Creek with a depth of 198 to 297 cm collected on September 8, 2011 would have the id: NC026SC-198-297-20110908
- The duplicate of this sample would have the id: NC1026SC-198-297-20110908

- A sediment grab collected at the 5th station of the Dutch Kills area with a depth of 0 to 15 cm collected April 27, 2012 would have the id: DK005SG-000-015-20120427
- A surface water sample collected in the upper water column of Maspeth Creek at the first station on May 16, 2012 would have the id: MC001SW-A-20120516
- A rinsate blank collected in association with chemistry core sampling collected on June 1, 2012 would have the id: SC-RB-20120601

5.1.2.1 Quality Control Samples

Field duplicates will be identified by adding 1000 to the 3-digit position number. Rinsate and trip blanks will use the 2-character tributary code, without a position indicator, and will not use the depth portion in their sample identifier.

For example:

- A chemistry core sample collected at the 26th station in Newtown Creek with a depth of 198 to 297 cm collected on September 8, 2011 would have the id: NC026SC-198-297-20110908
- The duplicate of this sample would have the id: NC1026SC-198-297-20110908
- A sediment grab collected at the 5th station of the Dutch Kills area with a depth of 0 to 15 cm collected April 27, 2012 would have the id: DK005SG-000-015-20120427
- A surface water sample collected in the upper water column of Maspeth Creek at the first station on May 16, 2012 would have the id: MC001SW-A-20120516
- A rinsate blank collected in association with chemistry core sampling collected on June 1, 2012 would have the id: SC-RB-20120601

5.1.3 Field Data

Procedures for collecting field data are provided in the RI/FS Work Plan and FSAP. Management of these data in the EQuIS database is presented below.

5.1.3.1 Loading of Field Electronic Data Deliverables

Sampling data recorded in the field that is not included in the laboratory analytical EDDs will be loaded into the database using the Anchor QEA field data EDD. Once EDDs are

prepared, they will be stored in a restricted-access project-specific folder for the Newtown Creek project. An internal laboratory data tracking application will be used to track the status of laboratory COC, deliverables, and data validation/quality assurance.

Items included in the field EDDs are:

- Sampling location information (e.g., sample identifier, coordinates [in the appropriate State Plane Coordinate System with respect to the North American Datum of 1983 or NAD83], elevation [in North American Vertical Datum of 1988 or NAVD88], water depth)
- Boring/coring information (e.g., date/time, technique, driller, geologist, depths, recoveries, lithology)
- Sample information (e.g., location, depth[s], sample type and, if duplicate, the associated normal parent sample)

Data loading procedures are generally similar to those for the laboratory analytical data loading (see Section 5.1.4.2 for instructions). Field EDDs should be available to load before laboratory analytical EDDs are available, and thus the Insert Only commit type in the EQuIS Data Processor (EDP) should be used most often.

5.1.3.2 Other Electronic Field Data

Other types of electronic field data will also be collected (e.g., hydrographic survey data, GIS data, aerial photographs, current meter data, and water column profiles). These data will be saved electronically to the project files.

5.1.3.3 Reporting Field Data

Applicable field data will be included in data summary reports). Field data (e.g., field measurements such as temperature, conductivity, pH, turbidity, etc.) will also be provided in data submitted to regulating agencies (see Section 7).

5.1.4 Analytical Data

Procedures for collecting field samples for laboratory analysis and the types of analyses to be conducted during the RI are provided in the FSAP and QAPP, respectively. This section provides an overview of the EDD to be used for analytical data during the RI/FS for Newtown Creek, the EDD loading process, field data verification, and analytical data validation.

5.1.4.1 Data Management Quality Assurance

Data management staff will review data received from field staff, laboratories and third parties using the following general procedures:

- Review field notes/logs
- Verify field coordinates with GIS group
- Record-by-record review of hard copy or electronic data transmittals from laboratories or data validators against the records loaded in the database (referred to as "back-checking") for 100% of validated results and 10% of unvalidated results
- For data transmitted through third-parties (not labs), 5% to 10% of loaded data records will be checked against data transmittals to verify import procedures
- For calculated or reported (by others) totals, hand calculations will be performed on subsets of data to verify totaled values

Procedures for checking, loading and updating data, including updates resulting from validation, are described below. Data validation procedures are described in detail in the QAPP (Anchor QEA 2011a).

5.1.4.2 Anchor QEA Electronic Data Deliverable Format File for Laboratory Results

Laboratories will be required to submit their results in Anchor QEA's EDD format and controlled vocabulary. As one or more sample delivery groups (SDGs) are completed, these will be e-mailed as compressed (in .zip format) attachments to Anchor QEA using the address, labdata@anchorqea.com. Designated Anchor QEA data management personnel will check and load the EDDs into the EQuIS database. Any errors in the EDD for a given SDG

will prevent loading of any data from that SDG and the issue(s) will be communicated to the designated laboratory project manager for correction and resubmission.

Required laboratory packages will be delivered on optical media by postal mail or courier in a format and schedule to be determined during laboratory sourcing. Delivery status will be recorded in Anchor QEA's tracking application.

5.1.4.3 Loading Laboratory Analytical Electronic Data Deliverables

Data management staff will load laboratory analytical EDDs to the database following the steps below:

- Use EDP connected to the Newtown Creek database facility and the Anchor QEA format (Version 5.4.3 as of June 1, 2011).
- Review errors, if any, to determine acceptability of EDD. EDDs will be rejected if they contain any of the following error types: incorrect valid values, missing required data, incorrect data types or values out of range, or inconsistent date/time values.
- Verify that tests were performed as requested and linked to the appropriate field and QC samples, consistent with COC.
- The status of the sample delivery group in the laboratory data tracker will be set to "Loaded" after successful upload of the EDD.

5.1.4.4 Laboratory and Field Quality Control Sample Requests

The Project Chemist will communicate the frequency of field QC sampling and laboratory QC sample requests to the Data Management Task Manager and Field Team Leader. This information will include the frequency of field duplicates, field blanks, laboratory duplicates, and matrix spikes and matrix spike duplicates, as well as any other field-generated QC samples or COC test requests. Field blank QC includes any field, equipment rinsate, or trip blank samples collected during the sampling event.

5.1.4.5 Data Validation

Field and analytical data verification and validation procedures, and the staff responsible for carrying them out, are defined in the QAPP (Worksheets #34, 35, and 36; Anchor QEA

2011a). Data verification (Worksheet #34), the first step in the overall validation process, ensures that field, chains of custody, and laboratory EDDs and data packages are reviewed for completeness and accuracy, as well as for conformance with the QAPP and FSAP. Additionally, audit reports will be reviewed to ensure that corrective actions are taken. Finally, assessment actions and reports will be reviewed for conformance with the QAPP and FSAP.

All analytical data will undergo a Stage 2B validation process as outlined in QAPP Worksheet #35. This Stage includes review of COCs, sampling holding times and preservation, checks with laboratory and field QC samples, and of calibration. Analyte-specific procedures are summarized in QAPP Worksheet #36 and worksheets referenced therein. Full validation (Stage 4), reviewing raw machine data and documentation, will be performed on the first SDG for each chemical group and medium (e.g., water, sediment, air, groundwater, biota tissue) from each laboratory, and then at a rate of one out of every ten SDGs thereafter. The Data Validation Coordinator will be responsible for ensuring that all proper validation procedures are followed.

The Data Validation Coordinator will notify the data management staff when validation for an SDG is complete and ready for inclusion in the database. Anchor QEA will use an auditable procedure to update original results with validated results and to document the validation level, validation personnel, dated validated, and reasons for qualification (if any).

5.1.4.6 Calculated Values

Calculated total results (e.g., for total polychlorinated biphenyls and polycyclic aromatic hydrocarbons) and toxic equivalents (TEQs) will be performed programmatically as data are exported for use. This assures that any data changes are reflected in values used for environmental assessments. Calculated values will be based on rules in accordance with the QAPP and/or work plans. Chemical names for calculated values will identify the rules used.

5.1.4.7 Post-validation Data Modifications

Once data are validated, changes to data, whether to result values, qualifiers, sample or location information, should be rare. Should any post validation data changes be required, they will be documented in a data change log.

A finalized version of the data will have to be agreed upon for consistent evaluation and reporting. A memorandum establishing a lock-out date for changes to the database will be submitted for approval by the Respondents and USEPA.

5.1.4.8 Reporting of Analytical Data to Agencies

Analytical results in the EQuIS database are marked both for their validation status, and their final approval for use. All reports generated from the database will be clearly marked as to whether data have been validated. Upon data quality review and validation as specified in this document and in the QAPP, all laboratory analytical data will be compiled into the specified USEPA and NYSDEC EDD formats along with field sampling information, observations, and field measurement data for a completed field activity. These EDDs will be transmitted to USEPA and NYSDEC as electronic attachments (on optical media) with the next available Monthly Progress Reports.

All data exports generated from the database will include the date the report was generated in the filename. Summarized data reports will display date and time in the file contents.

A data change log will be kept of any database changes made post-validation. These changes will be communicated to USEPA by e-mail concurrent with regularly-schedule data submittals.

5.2 Historical Data

Procedures for collecting field historical data are provided in the DCP (Anchor QEA 2011c). Management of these data and the associated document repository is presented below. Additionally, Section 3.2.1 of the RI/FS Work Plan states that a database will be developed for historical upland analytical data of acceptable quality. Once the extent and quality of the available and relevant historical data is understood, an addendum to this DMP that defines

the management plan for the analytical and the associated property data will be drafted for agency approval.

5.2.1 Data Management Process for Historical Data

A variety of data (including various technical reports, sampling results, and other relevant information) will be collected, reviewed, and evaluated during the Historical Data Review. As files are obtained from the various agencies and other repositories, they will be catalogued and electronically stored.

The following are the roles and responsibilities of the staff conducting the Historical Data Review:

- Historical Data Review Task Manager – Responsible for overseeing the collection of historical data to support RI/FS objectives. Delegates work to one or more Data Intake Assistants or Data Collectors.
- Document Manager – Responsible for maintaining the RI/FS historical data and document repository.
- Data Collector – Responsible for collection of historical data under the direction of the Historical Data Review Task Manager.

Prior to the receipt of historical data, an electronic filing system will be established to file data at different stages of the data management process.

The first step in the process is the intake of newly collected data. Once data are collected (as described in the DCP), a Record Batch Collection Transmittal form (Form 1 in Appendix A) is completed and sent with the data collected to the Historical Data Review Task Manager. The following describes the activities which comprise the intake process:

- Review of Record Batch Collection Transmittal form (Form 1) and attached data for completeness.
- Documentation of receipt of collected data.
- Filing of electronic documents with a scan copy of the Record Batch Collection Transmittal form (Form 1) as the cover page in intake folder (or placement of hard copy documents with associated Form 1 in document intake drawer) and assignment

of intake responsibility.

- Unitizing, scanning and completion of Optical Character Recognition (OCR) process on hard copy and static documents, as appropriate, and ensuring electronic documents are searchable. This includes the following steps.
  - Electronic static (PDF) documents will be checked for OCR. If not already text searchable with OCR, then OCR is performed on the electronic file. Large files are divided into logical units (unitized) to avoid file sizes greater than approximately 3 megabytes (MB).
  - Hard copy data are unitized as necessary and scanned to PDF with OCR.
  - Scanning of parts, exhibits and attachments: large complex documents will be scanned and converted to PDFs in logical units. The part number of the document will be appended to the title (e.g., -01, -02, etc.).
- Review of scanned documents for completeness and legibility of scan (all pages are present, all pages are readable, and document is consistent with source document).
- Assignment of a document name; when scanned and converted to PDF all documents will be assigned a name as described in Section 5.2.2.

The second step is the data classification and qualification process. During this process the data are reviewed and classified for use as part of the RI/FS. The following activities are part of Step 2:

- Data qualification for compliance with Minimum Data Acceptance Criteria (MDAC).
- Review and sign-off on compliance with MDAC or flagging of document for other potential issues or constraints.
- Review and flagging of data/document for potential data suitability issues, including, but not limited to:
  - Suspect data source for technical use (appears to be promotional or non-scientific)
  - Partial document/document extract resulting in incomplete documentation
  - Electronic data without supporting documentation regarding data source and quality assurance
- Review of suspect documents by Historical Data Review Task Manager and determination of whether RI Manager should be consulted for identification of

necessary restrictions on data use.

- Filing of data/document acceptable for use in the repository.
- Documentation of acceptable uses with and without additional review as follows:
  - Suitable for general background information only
  - Unrestricted; acceptable for technical uses subject to Activity Specific Acceptance Criteria (ASAC) limitations
  - Restricted; requires PM authorization for use
  - Prohibited; not approved for use, data potentially suspect and under secondary review
  - Prohibited; after secondary review, not approved for all or certain uses
  - Review and acceptance of record update by Document Manager or clarification is sought from reviewer prior to acceptance

5.2.2 Naming Conventions

Historical data will be assigned a document name using the following format:

- Publication Date first: yyyy-mm-dd. This allows documents within a topical folder to be sorted by date and facilitates orderly review and analysis of related materials. If month and day are unknown, these will be defaulted to "-01-01."
- Title: Actual titles visible on the document will be incorporated into the name of the PDF using the significant key words of the title and approved abbreviations. This will include subject lines on letters and memoranda, headings on charts, title blocks on maps.
  - Example Document Citation: Handex, 1995. Annual Groundwater Sampling/ Monthly Monitoring Report. Shell Oil Terminal, 25 Paidge Avenue, Brooklyn, New York, June 30.
  - Example Repository File Name: 1995-06-30 Shell Annual GW Sampling.pdf.

For large complex documents that are scanned and converted to PDFs in logical units. The part number of the document will be appended to the title (e.g., -01, -02, etc.).

5.2.3 Historical Data Review Quality Assurance/Quality Control Processes

The QA/QC process serves to evaluate the completeness and accuracy of data collection and management. Although the entire project team is tasked with ensuring that QA/QC requirements are met, the primary project staff members responsible for the QA/QC process for the Historical Data Review are the Document Manager and Historical Data Review Task Manager.

MDAC have been established for the analytical data collected during the Historical Data Review. The MDAC will determine if data are acceptable for potential use in specific elements of the RI/FS without additional review and sign-off. These MDAC include:

- Data are from a known, documented source (e.g., government agency, scholarly research article or document, other technical documents)
- Data are from the original source (as opposed to quoted/referenced in a secondary source)
- Data have adequate QA documentation
- For analytical data:
  - Data tables are available (i.e., not summary format) with laboratory reports and data validation information
  - Standard, currently acceptable methods were used for data analysis
  - Appropriate detection limits are achieved so that data meet RI/FS DQOs

Data not meeting MDAC may undergo further review by the Project Manager, RI Manager, or their designees for alternate acceptance for use. Based on their review, the data may be accepted for only limited use, accepted for broader use subject to ASAC, or rejected for all uses. However, data will not be removed from the data repository.

ASAC are need-specific criteria (e.g., age of data, detection limits, methods use) as appropriate for a specific data use. They are developed for specific technical uses and may include required (must exist for use) and desired (beneficial but not essential for use) criteria. These criteria are not addressed in detail in this document, but will be provided if data are used for activity-specific uses.

As discussed above, analytical data collected from historical sources will be evaluated for quality, including a QA/QC review if appropriate, related to their addition to the analytical database and use in the RI/FS. This quality review, including how the quality of the data relates to the use, will be submitted to the USEPA in reports in which the data are used. These reports are subject to USEPA's review and approval.

Table 5-1

Field-related Data Management Activities and Responsible Parties

Activity	Recording	Transfer	Tracking	Storage and Retrieval	Quality Control, Internal Checks, Corrective Action
Database setup	N/A	N/A	N/A	EQuIS 5 Professional database with United States Environmental Protection Agency (USEPA) Region 2 valid values. *Data Management Task Manager or designee*	N/A
Documenting locations of field activities	Direct recording by differential or Real Time Kinematic (RTK) Global Positioning System (GPS). Location identifier, type, date established recorded on form* and coordinates associated by timestamp, or by entry into GPS unit at time of observation. *Field Team Leader*	Send GPS download files (e-mail) and/or location forms (scan and e-mail or fax) to the Data Management Task Manager or designee on the day of collection. *Field Team Leader*	Check field forms/files against planned and/or other recorded field activities. *Data Management Task Manager or designee*	Original GPS data files are stored in project electronic files. GPS data gets loaded into project database, with the RI/FS program coordinate system and elevation datum recorded for each observation. *Data Management Task Manager or designee*	Positions as recorded are plotted on accurate basemaps for comparison against planned positions and for logical consistency. Discrepancies are immediately investigated with Field Team Leader and Project Quality Assurance (QA) Manager for resolution. *Data Management Task Manager or designee*

Table 5-1

Field-related Data Management Activities and Responsible Parties

Activity	Recording	Transfer	Tracking	Storage and Retrieval	Quality Control, Internal Checks, Corrective Action
Photo documenting field activities and features	Direct recording by digital camera. Location identifier, subject, date established recorded on form* and coordinates (see "Documenting locations of field activities") associated by timestamp. *Field Team Leader*	Send email to Data Management Task Manager or designee that digital camera download files have been transferred to the project drive (either uploaded directly to the network, or transferred using a file transfer protocol (FTP)-like system) and send forms (scan and e-mail or fax) to the Data Management Task Manager or designee on the day of collection. *Field Team Leader*	Check field forms/files against planned and/or other recorded field activities. *Data Management Task Manager or designee*	Original digital camera files are stored in project electronic files. GPS data gets loaded into project database, with the correct coordinate system and elevation datum recorded for each observation. *Data Management Task Manager or designee*	Positions as recorded are plotted on accurate basemaps for comparison for logical consistency with the photo logs. Discrepancies are immediately investigated with Field Team Leader and QA Coordinator for resolution. *Data Management Task Manager or designee*

Table 5-1

Field-related Data Management Activities and Responsible Parties

Activity	Recording	Transfer	Tracking	Storage and Retrieval	Quality Control, Internal Checks, Corrective Action
Sample collection	Sampling information recorded on pre-filled paper or electronic forms*. Chain of custody (COC) prepared. *Field Team Leader*	Send sample collection forms and COC forms to the Data Management Task Manager or designee by e-mail or fax each day. *Field Team Leader*	Check sampling forms against corresponding COC forms. *Field Team Leader, Project Chemist, and Data Management Task Manager or designee*	Original field forms and COC forms are stored in project files. Data from forms are transcribed to electronic data deliverable* (EDD) format, and then loaded to project database before lab results for these samples are received. *Data Management Task Manager or designee*	Sampling data from database are checked when received against original sampling forms and COCs to verify accuracy. Discrepancies are immediately investigated with Field Team Leader and Project QA Coordinator for resolution. *Data Management Task Manager or designee*

Table 5-1

Field-related Data Management Activities and Responsible Parties

Activity	Recording	Transfer	Tracking	Storage and Retrieval	Quality Control, Internal Checks, Corrective Action
Field measurements	Field measurements recorded on sampling form or on other standardized forms or electronic field measurement forms*. Some field measurements will be recorded electronically via instrumentation. Raw data files and Field Measurement EDD will be delivered to the Data Management Task Manager or designee. Instrument calibration activities documented in bound, waterproof field logbooks. *Field Team Leader*	Send field measurement forms to the Data Management Task Manager or designee by e-mail or fax each day. Raw data files and Field Measurement EDDs from electronically recorded measurements are emailed to the Data Management Task Manager or designee after review by the Field Team Leader (or designate). EDDs loaded into project database. *Field Team Leader*	Check field forms against planned activities. Check raw data files and EDDs against planned activities. *Data Management Task Manager or designee*	Original field forms and raw data files get stored in project folders. Data from forms gets transcribed to EDD format, then loaded to project database. EDDs as received get stored in project electronic folders, with separate folders for EDDs received pending disposition, EDDs rejected, and EDDs successfully loaded into the database. Once an EDD is loaded into the project database, the database becomes the authoritative version of that data for all project use. *Data Management Task Manager or designee*	Field measurement data from the database is reported and checked against original recording source to verify accuracy. Discrepancies are immediately investigated with Field Team Leader and Data Management Task Manager or designee for resolution. Electronically recorded data is reviewed for reasonableness during collection by the Field Team Leader. Field Team Leader may recommend the application of a correction to the raw data files. *Field Team Leader and Data Management Task Manager or designee*

Table 5-1

Field-related Data Management Activities and Responsible Parties

Activity	Recording	Transfer	Tracking	Storage and Retrieval	Quality Control, Internal Checks, Corrective Action
Continuous field measurements	Continuous field measurements will be recorded using a Datalogger. *Field Team Leader*	Raw Data Files and Field Measurement EDD* will be delivered to the Data Management Task Manager or designee via email after retrieval and review by the Field Team Leader or designate. EDDs loaded into project database. *Field Team Leader/Data Management Task Manager or designee*	Check EDDs against planned monitoring. *Data Management Task Manager or designee*	Raw Datalogger files get stored in project files. EDDs as received get stored in project electronic folders, with separate folders for EDDs received pending disposition, EDDs rejected, and EDDs successfully loaded into the database. Once an EDD is loaded into the project database, the database becomes the authoritative version of that data for all project use. *Data Management Task Manager or designee*	Data will be immediately downloaded and viewed in the field by the Field Team Leader to determine completeness and reasonableness of the data. If there are data quality issues, the Field Team Leader will determine whether the data is unusable or whether a correction should be applied to the data. *Field Team Leader*
Core Processing	Direct recording by digital camera. Sample location and depth identifier, date established recorded on form (see "Documenting locations of field activities") associated by timestamp.	Transfer digital camera files and forms (scan and e-mail or fax) to the Data Management Task Manager or designee on the day of collection.	Check field forms/files against planned activities, and/or other recorded field activities.	Original digital camera files are stored in project electronic files.	Discrepancies are immediately investigated with Field Team Leader and Project QA Coordinator for resolution.

Table 5-1

Field-related Data Management Activities and Responsible Parties

Activity	Recording	Transfer	Tracking	Storage and Retrieval	Quality Control, Internal Checks, Corrective Action
Core Processing, continued	Core information recorded on pre-filled paper or electronic forms*. *Field Team Leader*	Send core information forms to the Data Management Task Manager or designee by e-mail or fax each day. *Field Team Leader*	Check field forms/files against standard nomenclature established for project. *Data Management Task Manager or designee*	Original field forms are stored in project files. Data from forms are transcribed to EDD format, then loaded to project database. *Data Management Task Manager or designee*	Core data from database is checked against original sampling forms to verify accuracy. Discrepancies are immediately investigated with Field Team Leader and Project QA Coordinator for resolution. *Data Management Task Manager or designee*

Table 5-1

Field-related Data Management Activities and Responsible Parties

Activity	Recording	Transfer	Tracking	Storage and Retrieval	Quality Control, Internal Checks, Corrective Action
Habitat and shoreline surveys	Habitat and shoreline survey data recorded on standardized forms or electronic field forms*. Some field observations will be recorded electronically via instrumentation, e.g., location. Raw data files will be delivered to the Data Management Task Manager or designee. *Field Team Leader*	Send survey forms to the Data Management Task Manager or designee by e-mail or fax each day. Raw data files from electronically recorded observations are emailed to the Data Management Task Manager or designee after review by the Field Team Leader (or designate). *Field Team Leader*	Check survey forms against planned activities. Check raw data files against planned activities. *Data Management Task Manager or designee*	Original survey forms and raw data files will be stored in project files. Data from forms will be transcribed to EDD format, and then loaded to project database. EDDs as received are stored in project electronic folders, with separate folders for EDDs received pending disposition, EDDs rejected, and EDDs successfully loaded into the database. Once an EDD is loaded into the project database, the database becomes the authoritative version of that data for all project use. *Data Management Task Manager or designee*	Survey data from the database is reported and checked against original recording source to verify accuracy. Discrepancies are immediately investigated with Field Team Leader and Data Management Task Manager or designee for resolution. Electronically recorded data is reviewed for reasonableness during collection by the Field Team Leader. Field Team Leader may recommend the application of a correction to the raw data files. *Field Team Leader and Data Management Task Manager or designee*

Table 5-1

Field-related Data Management Activities and Responsible Parties

Activity	Recording	Transfer	Tracking	Storage and Retrieval	Quality Control, Internal Checks, Corrective Action
Lab analytical data	EDD in the Earthsoft EQuIS 4-file format, with USEPA Region 2 reference values as specified for this project, and error logs. Hardcopy Level IV, Contract Laboratory Program (CLP)-type data package or as specified in the Quality Assurance Project Plan (QAPP). *Laboratory Project Managers*	E-mail to Data Management Task Manager or designee. EDDs loaded into project database. Data report is stored in project electronic files. *Laboratory Project Managers/Data Management Task Manager or designee*	Check EDDs against planned test activities and COC forms. Check that associated data report received for corresponding EDD. The EDD and data report for each analytical fraction of each Sample Delivery Group (SDG) is entered into the validation tracking system. *Project Chemist and Data Management Task Manager or designee*	EDDs and data reports, as received, are stored in project electronic folders. Separate folders are used for EDDs received pending disposition, EDDs rejected, and EDDs successfully loaded into the database. Once an EDD is loaded into the project database, the database becomes the authoritative version of that data for all project use. *Data Management Task Manager or designee*	EDD contents checked against COC forms for completeness and accuracy upon receipt of EDD. Data as loaded to the database is checked against the data reports to make sure the EDD, database, and data report agree. Discrepancies are immediately investigated with laboratory, Field Team Leader, Project Chemist, and Project QA Coordinator for resolution. *Data Management Task Manager or designee*

Table 5-1

Field-related Data Management Activities and Responsible Parties

Activity	Recording	Transfer	Tracking	Storage and Retrieval	Quality Control, Internal Checks, Corrective Action
Data validation updates	Summary of validation findings documented in data validation report (DVR). Data updates produced during validation will be recorded in a sample data spreadsheet generated from the database. *Data Validation Coordinator*	Spreadsheets of validated data for completed SDGs will be transferred to the Data Manager for upload to the database. *Data Validation Coordinator*	Progress/status documented in the validation tracking system. *Data Validation Coordinator*	Spreadsheets of validated data are archived with DVR for that SDG in the project electronic folders. Validated spreadsheets are loaded into the database and all the SDG's results marked as validated. *Data Management Task Manager or designee*	Data checks are run for each validated SDG to identify discrepancies. Discrepancies are immediately fixed. Once QA is passed, results are marked in database as approved for use. DVRs subject to peer review. *Data Management Task Manager or designee*

Table 5-1

Field-related Data Management Activities and Responsible Parties

Activity	Recording	Transfer	Tracking	Storage and Retrieval	Quality Control, Internal Checks, Corrective Action
USEPA data submittal**	Validated data generated from database will be posted to SharePoint. *Data Management Task Manager or designee*	Exports of validated data are loaded to SharePoint site and emailed to USEPA notifying them of data availability. EDDs are due with the monthly status reports per the Administrative Order on Consent (AOC). *Data Management Task Manager or designee*	Database updated to record date that exports were posted to SharePoint site. *Data Management Task Manager or designee*	Exports of validated data are archived with electronic project files. *Data Management Task Manager or designee*	Verify validated data exports are posted to SharePoint site. *Data Management Task Manager or designee*

Notes:

* Examples of field forms can be found in the Field Sampling and Analysis Plan (FSAP) (Anchor QEA 2011b).

** In the event that revisions to data are necessary following delivery, an email will be sent to appropriate parties to convey these changes.

NA – not applicable

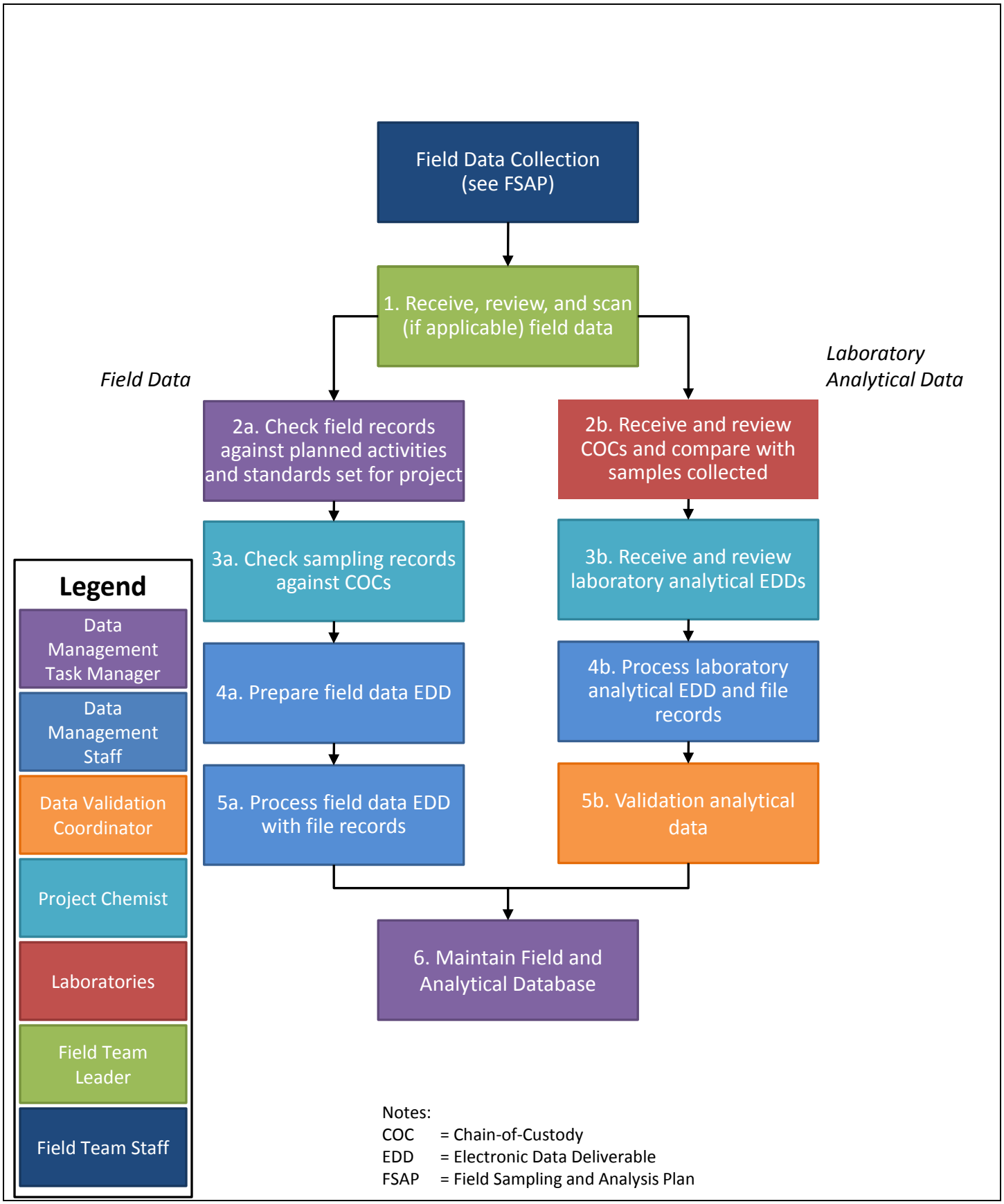

Figure 5-1
Field Data and Laboratory Analytical Management
Data Management Plan
Newtown Creek RI/FS

6 DATA PROTECTION AND SECURITY

The information systems that will house data, including field and analytical data as well as other electronic information include systems within Anchor QEA's offices, in a data center facility, and an off-site storage location for tape backups. The procedures that protect and secure these information systems are described here.

Servers in Anchor QEA's facilities are physically secured in locked buildings and rooms, with access limited to authorized personnel. Servers are electronically secured behind firewalls with multiple layers of anti-malware software that protect the firewall, the local area networks, and e-mails. Servers and networking equipment are connected to battery-based uninterruptable power supplies (UPSs) with automated shutdown procedures in the event of a power outage.

Operating system and third-party software are licensed and maintained with vendor-supplied security patches. Major updates are evaluated and testing, and project managers are consulted regarding the impact of major updates prior to deployment on production servers.

Servers and attached storage arrays are equipped with enterprise-class hard disks configured in redundant-array-of-independent-disks level 5 (RAID-5) formats, which provide protection against single-drive failure. Volume shadowing is enabled, allowing approximately 30 days of roll-back/recovery of files. Routine backups to magnetic tape are performed, using weekly full backups and daily incremental backs on a six-cycle rotation. All but the current cycle are stored off-site and every 6 weeks, a full backup is permanently archived in a secure off-site location. Lastly, daily snapshot backups to hard disk are performed on project relational database management systems.

Access to these servers is limited to authorized system administrators through physical locks and through domain permissions. Access to central data management systems is limited by permissions to authorized project-specific data management personnel.

7 DATA TRANSMITTAL TO REGULATING AGENCIES

Data collected during the RI/FS will be provided to USEPA monthly, according to the requirements for contents and schedule provided in the AOC. Additionally, laboratory analytical data will be provided to NYSDEC at the end of each phase of work. Anchor QEA will generate USEPA Region 2 EDDs that meet the specifications provided for "Comprehensive" EDDs on their EDD website at http://www.epa.gov/Region2/superfund/medd.htm. The Region 2 EDDs will be delivered according to the procedures on the Region 2 website (via e-mail to Region2_equisedd@epa.gov), or other method as directed by the USEPA Remedial Project Manager. Data delivered to NYSDEC will meet the EDD preparation and submission requirements provided by NYSDEC at http://www.dec.ny.gov/chemical/62440.html. Data will be released for use, including delivery to regulating agencies, only after completion of the validation.

Data submitted to regulating agencies will be flagged in the project database with the date of export. The database also logs the date of changes, so that records changed after the date of export can be identified and exported as needed. Changes will be briefly described in a text file that will be distributed through e-mail to agency representatives and team members at the time of data submittal.

Field and laboratory analytical data will be incorporated into the Phase 1 Interim Data Report, Phase 1 RI Data Summary Report, and the RI Report. Data from the Historical Data Review will be incorporated into the Phase 1 Interim Data Report, the Data Applicability Report, and the RI Report. Each of these documents in summarized in the RI/FS Work Plan.

8 REFERENCES

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Anchor QEA, 2011a. *Quality Assurance Project Plan, Remedial Investigation/Feasibility Study Work, Newtown Creek*. July 2011.

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USEPA, 2011b. *Region 2 Green Remediation*. Updated January 31, 2011. Available at: http://www.epa.gov/region02/superfund/green_remediation.

USEPA, 2011c. *Administrative Settlement Agreement on Order on Consent for Remedial Investigation/Feasibility Study, Newtown Creek Superfund Site, Kings County and Queens County, New York City, New York.* USEPA Docket No. CERCLA-02-2011-2011. July 18, 2011

APPENDIX A
HISTORICAL DATA REVIEW FORMS

Form 1. Batch Record Transmittal Form – Newtown Creek RI/FS

Batch Number	<NEWT-YYYYMMDD-X>
Site Identifier (if applicable)	<Name of Site(s) or "NA" if general information>
Source of Data	<Institution/Contact Name/Address/Phone number/email> <Institution/website URL/date downloaded>
FOIL/FOIA Request	☐ Yes ☐ No
Data Collector	<data collector name and company>
Data Collector Phone Number	<phone number>
Date Collected	<date - YYYY-MM-DD>
Description of Data	<brief summary of information contained in the document; intended to provide brief description of type of data included in document>
Privilege Category (check all that apply)	☐ None; publicly available information ☐ Attorney Work Product ☐ Attorney-Client ☐ Attorney-Client and Attorney Work Product ☐ Confidential Settlement ☐ Confidential Business Information
Data Format (check all that apply)	**Hardcopy** ☐ Report text ☐ Table ☐ Map, aerial photos ☐ Other (please specify) _____ **Electronic** ☐ Report text – editable ☐ Report text – non-editable ☐ Table – editable ☐ Table – non-editable ☐ Map, aerial – editable ☐ Map, aerial – non-editable ☐ GIS coverage ☐ Database ☐ Other (please specify) _____
Initial Storage Location of Hardcopy	<Office Location, Room, File cabinet/Shelf>
Data Collected	1. <List all data collected by title or describe each item as needed> 2. 3. Etc.